

Office Action Summary

Application No.

10/508,451

Applicant(s)

BREEUWER, MARCEL

Examiner

KALPANA BHARADWAJ

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date: _____

- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date: 08/12/2009
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. This Office Action is in response to an AMENDMENT entered 06/02/2009 for the patent application 10/508,451 filed on 09/21/2004.
2. All prior office actions are fully incorporated into this Office Action by reference.

Examiner Recommendation

3. Refer to interview summary.

Status of Claims

4. Claims 1-20 are pending.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1, 11 and 12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. 'Image data acquired by a tomographic imaging system' is not defined either in the specification or the diagrams. Claims 2-10 and 13-20 are rejected for being dependent on a rejected claim. Appropriate correction is required.

Response to Arguments

7. Applicant's arguments regarding rejection of claims 1-20 under 35 USC § 101 have been persuasive, and therefore the rejection under 35 USC § 101 have been withdrawn.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Stadler (USPN 2002/0016548, referred to as **Stadler**).

Claim 1, 11, 12:

Stadler teaches a method of analyzing a quantity having temporal and spatial variations (**Stadler**, ¶ 0063: multi-dimensional "spatial vector"), including:

Obtaining a multidimensional output data array is formed (**Stadler**, ¶ 0063: multi-dimensional "spatial vector") the multidimensional output data array

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comprising array positions (**Stadler**, ¶ 0029: 3-dimensional vector, whose position is determined) arranged along at least a first data-axis and a second data-axis (**Stadler**, ¶ 0065: three axis EGM signals); and

receiving with a processor values corresponding to the quantity indicative of blood perfusion tissue (**Stadler**, ¶ 0148: adapt this system for devices ... pumps oxygenated blood out; **EN**: 'perfusion' is a delivery of arterial blood to a capillary, which is what the device is doing) based on time series perfusion images generated from image data acquired by a tomographic imaging system (**Stadler**, ¶ 0070: data related to detection of ischemia);

wherein first values corresponding to the quantity at substantially a same instant in time are mapped by the processor to respective positions in the multidimensional output data array at equal positions along the first data-axis (**Stadler**, ¶ 0083: defining a set of sampled time points; **EN**: sampled time points are values at particular instants of time; **EN**: A sampled time-varying data is periodic, meaning it repeats at fixed/equal intervals of time, where the periodicity is defined by the sampling rate) and values corresponding to the quantity at substantially a same spatial position are mapped by the processor to respective positions (**Stadler**, ¶ 0083: defining a set of sampled time points; **EN**: sampled time points are values mapped at particular instants of time. A sampled time-varying data is periodic, meaning it repeats at fixed/equal intervals of time, where the periodicity is defined by the sampling rate) in the multidimensional output data array at equal positions along the second data-axis (**Stadler**, ¶ 0063: spatial vectors).

Claim 2:

Stadler teaches a method as claimed in claim 1, further including:

Acquiring the first and second values of the quantity are acquired for respective temporal instants and for respective spatial sections; and

Mapping the second values of the quantity for individual spatial sections to respective positions in the multidimensional output data array at equal positions along the second data-axis (**Stadler, ¶ 0063**: processing spatial vectors; **EN**: processing involves entering positions on the axis).

Claim 3:

Stadler teaches a method as claimed in claim 1, further including acquiring the first and second values of the quantity for respective time intervals (**Stadler, ¶ Data related to ... generated in real time**) and for respective spatial positions and mapping the first values of the quantity for individual time interval are entered at respective positions in the multidimensional output data array at equal positions along the first data-axis (**Stadler, ¶ 0073**: manipulating the data values).

Claim 4:

Stadler teaches the method as claimed in claim 1, further including mapping the first values of the quantity for successive time intervals to adjacent positions (**Stadler, ¶ 0005**: PQIRST sequence) in the multidimensional output data array and values of the quantity for adjacent spatial sections to adjacent

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positions in the multidimensional output data array (**Stadler**, ¶ 0005: successive PQRST complexes).

Claim 5:

Stadler teaches a method as claimed in claim 4, further including mapping the second values of the quantity for radially contiguous spatial sections (**Stadler**, ¶ 0139: radians per cardiac cycle) to contiguous positions in the multidimensional output data array (**Stadler**, ¶ 0139: filter characteristics are tuned from empirical data).

Claim 6:

Stadler teaches the method as claimed in claim 1, wherein the first and second values of the quantity are derived from the time series of perfusion images (**Stadler**, ¶ 0002: monitoring electrocardiogram).

Claim 7:

Stadler teaches a method as claimed in claim 6, wherein the first values of the quantity at respective instants of time are derived from respective images in said time series perfusion images (**Stadler**, ¶ 0005: waveform characterized by a periodic PQRST electrical activation sequence).

Claim 8:

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Stadler teaches a method as claimed in claim 7, further including linking respective positions in the multidimensional output data array to respective spatial sections in respective images of the time series perfusion images (Stadler, ¶ 0063: processing spatial vectors).

Claim 9:

Stadler teaches a method as claimed in claim 8, further including:
displaying the multidimensional output data array;
indicating a position in the displayed multidimensional output data array;
and
displaying the respective image of the time series perfusion images on the basis of the respective indicated position in the displayed multidimensional output data array and marking the respective spatial section in the image (Stadler, ¶ 0056: A display 59 would enable graphic and textual interface).

Claim 10:

Stadler teaches a method as claimed in claim 1, wherein the quantity pertains to perfusion of the myocardium (Stadler, ¶ 0007: ischemic myocardium).

Claim 13:

Stadler teaches the method of claim 1, further comprising displaying the multidimensional output data array (Stadler, ¶ 0056: A display 59).

Claim 14:

Stadler teaches the method of claim 13, wherein the values of the quantity are derived from image data, and further comprising displaying the image data while displaying the multidimensional output data array (**Stadler, ¶¶ 0070: data related to detection of ischemia**).

Claim 15:

Stadler teaches the method of claim 1, wherein the quantity is an average brightness value of image data (**Stadler, ¶¶ 0010: an average normal ST signal level**).

Claim 16:

Stadler teaches the method of claim 15, wherein the image data comprises perfusion data of a human myocardium (**Stadler, ¶¶ 0007: ischemic myocardium**).

Claim 17:

Stadler teaches the system of claim 11, further comprising a display device adapted to display the multidimensional output data array (**Stadler, ¶¶ 0056: display 59**).

Claim 18:

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Stadler teaches the system of claim 17, wherein the values of the quantity are derived from image data, and wherein the display device is further adapted to display the image data while displaying the multidimensional output data array (**Stadler**, Fig 4 & 5).

Claim 19:

Stadler teaches the system of claim 11, wherein the quantity is an average brightness value of image data (**Stadler**, ¶ 0010: an average normal ST signal level).

Claim 20:

Stadler teaches the system of claim 19, wherein the image data comprises perfusion data of a human myocardium (**Stadler**, ¶ 0007: ischemic myocardium).

Response to Argument

10. Applicant's arguments filed 06/02/2009 have been fully considered but they are not persuasive.

Argument 1:

Amended independent **claim 1** recites receiving **values corresponding to a quantity indicative of blood perfusion through tissue** based on time series perfusion images generated from image data **acquired by a tomographic imaging system**. Stadler et al. does not teach or suggest at least the above emphasized claim aspects.

Examiner's response:

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Refer to -- receiving with a processor values corresponding to a quantity indicative of blood perfusion tissue (**Stadler**, ¶ 0148: adapt this system for devices ... pumps oxygenated blood out; **EN**: 'perfusion' is a delivery of arterial blood to a capillary, which is exactly what the device is doing). Stadler's invention receives data from a device that pumps oxygenated blood out through the aortic arch 12, which leads to the right subclavian artery. This is nothing but a value corresponding to blood perfusion.

Refer to -- acquired by a tomographic imaging system (**Stadler**, ¶ 0070: data related to detection of ischemia). Ischemia is a restriction in blood supply due to factors in the blood vessels, with resultant dysfunction of tissue. The detection of ischemia is performed one of several imaging systems, and therefore the data related to the detection of ischemia reads on 'acquired by a tomographic imaging system.' The examiner has given a broad interpretation of imaging systems that includes tomographic systems. The applicant has not defined 'tomographic imaging' -- refer to the examiner's 112 rejection.

Argument 2:

However, claim 1 requires receiving with a processor values corresponding to a quantity indicative of blood perfusion through tissue based on time series perfusion images generated from image data acquired by a tomographic imaging system. In view of the preceding paragraph, the cited sections of Stadler et al. fail to teach images generated from image data acquired by a tomographic imaging system as required by claim 1. Accordingly, this rejection should be withdrawn.

Examiner's response:

Same response as for Argument 1 applies.

Examination Considerations

11. Examiner has cited particular columns and line numbers or paragraph numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the Applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner. The entire reference is considered to provide disclosure relating to the claimed invention.

Conclusion

12. Claims 1-20 stand rejected.
13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory

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period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KALPANA BHARADWAJ whose telephone number is (571)270-1641. The examiner can normally be reached on Monday-Friday 7:30am 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Vincent can be reached on (571) 272-3080. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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